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cornua, sides or fundus of the uterus; (6) the disposition of the crypts, fossæ, pits or folds of the uterine mucosa; (7) the arrangement and disposition of uterine vessels from which the maternal tufts or villi are fed and derived. These influences are largely mechanical in character, and like the influence exerted by the vitellus, lead, in certain cases, to very remarkable modifications of embryonic development.

The foregoing scheme deals more especially with the evolution of the various higher types of development, and if the way in which these have grown out of the lower ones has been made a little less obscure than hitherto, my object in writing this will have been attained. The manner in which placentation has been modified is also a fruitful subject for farther investigation, not less so, in fact, than the question as to how the amnion arose. The facts of embryology tend to show that the amnion is the result, as stated above, of the gradual invagination of the embryo into the blastodermic vesicle. The invagination begins at the head end of the embryo; the amnion, as is well known, always developing its first traces at the cephalic end of the embryonic disk. It is also probable that the cavity of the false amnion is the homologue of the cleavage cavity of certain of the lower forms.—*John A. Ryder.*

PHYSIOLOGY.[1]

A CONTRIBUTION TO THE KNOWLEDGE OF PEPSIN[2].—Sundberg has hit upon a method for preparing pepsin, which gives results better than those obtained by Brücke's method.

Calves' stomachs are taken, the pyloric portion removedand the remainder of the mucous membrane carefully washed with water. The superficial portion of the membrane is then scraped off with a watch glass, and the substance thus obtained is ground up with a weighed quantity of salt. Enough water is added to this to make a saturated solution of salt. After standing 24–72 hours this was filtered and the Na Cl removed by dialysis. The dialysed liquid contained very little albumin and had a very powerful peptic action. It was further purified by being kept at 40° C. for some time to destroy the rennet ferment, and was then allowed to digest itself for one or two weeks, until all the albumin was converted into peptone. To this liquid chloride of calcium and acid sodium phosphate were added, and the liquid made weakly alkaline by ammonia; the resulting precipitate of calcium phosphate carried down the pepsin with it. The precipitate was collected in a filter, thoroughly washed with water and dissolved in as small a quantity as possible of five per cent HCl. This solution was then thoroughly dialysed. The liquor obtained finally, when brought to the proper degree of acidity, digested very actively. With tannic acid, mercuric chloride, iodine, platinum chloride, and lead acetate it gave no albumin reaction whatever. The only reagent that affected it was absolute alcohol. When the pepsin solution was added to five or six times its volume of alcohol a slight white precipitate occurred. This, when burnt on platinum foil, gave the well-known odor of burning nitrogenous matter. The author concludes, that while pepsin is a nitrogenous body, it is not albuminous.

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[1] This department is edited by Professor HENRY SEWALL, of Ann Arbor, Mich.

[2] Zeitsch. f. physiol. Chemis. 9, 319. Sundberg.

CONTRIBUTION TO THE KNOWLEDGE OF BILE CAPILLARIES[1].—Miura has discovered a modification of the gold method by which the bile capillaries can be stained, giving a simpler means for their study than the method of artificial injection usually employed. Pieces of liver kept in Müller's liquid for two to five days are washed in water for several hours, and then transferred to a fifteen per cent solution of glucose for 2–3 hours. They are then placed in a 0.1 to 0.2 per cent solution of the double chloride of gold and sodium for two or three days, and again placed in the glucose solution and allowed to reduce for two or three days. Sections are cut by means of a freezing microtome.

Miura has endeavored to settle two questions by this method. 1. Do the Kupffer vacuoles really exist in the liver cells as the beginning of the bile capillaries? His method gives no indication at all of these vacuoles, and he infers that, as usually found, they are artificial products caused by the pressure used in injection. 2. Have the bile capillaries walls? When their sections were traced out he quite frequently found places in which the broken ends of the capillaries projected beyond the cells, or where they formed a bridge passing between two cells at a point where they had been separated by the tracing needle. He concludes from these appearances that the capillaries have walls of their own.

THE MICROSCOPIC APPEARANCE OF STRIPED MUSCLE DURING CONTRACTION[2].—The author investigated the muscle when thrown into maximal tetanus, and when the tetanus was not maximal. The muscle was stimulated by induction shocks and killed during contraction by osmic acid or alcohol.

The muscle of maximal tetanus when thus treated showed certain bands (contraction bands) running across the fibers, representing, doubtless, Krause's membrane of the resting muscle. Between these contraction bands the fiber was swollen out, giving a convex border. Examined by polarized light, the whole substance of the fiber is found to be doubly refracting. The contraction band representing Krause's membrane undergoes no change during contraction; it appears, in the author's opinion, to play the passive part of giving a fixed support from the shortening. The portions in between the contraction bands, also doubly refracting, represent the dim bands of the resting muscle, while the singly refracting light bands of the resting muscle disappear completely during maximal tetanus, being absorbed apparently by the doubly refracting substance of the dim band. When the tetanus was not maximal some of the singly refracting substance was still found in the contracted fiber.

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[1] Virchow's Archiv., 99–512. Dr. Miura.

[2] Du Bois Reymond Archiv., 1885. S. 150. Dr. Nickolaides.

The results given go to support Englemann's theory of muscle contraction, according to which the shortening of the contracted fiber is owing to the absorption by imbibition of the singly refracting substance of certain ultimate elements in the doubly refracting substance, thus becoming spherical during the act and decreasing in diameter.

PSYCHOLOGY.

Do Monkeys invariably Learn by Experience?—Some time ago I read a statement to the effect that monkeys were unable to learn by experience, a particular in which they were said to differ from cats. The experiment suggested was to show the animal its reflection in a mirror, and after a time to repeat the process and observe whether it would be deceived a second time. I have never had the opportunity to try the experiment on monkeys, though I am told, on tolerably good authority, that a monkey can never satisfy itself that there is not another monkey behind the glass. But my acquaintance with cats is somewhat larger, and I find that, after once thoroughly investigating the subject, a cat which has reached an age of discretion takes no further interest in its own reflection. The question in my mind is: if a monkey cannot learn by experience, how can it learn? for it seems to me that almost every means of learning can be reduced to some form of experience, or to something that is practically the same thing.—*W. H. Frost, Brown University.*

A Dog's Strategy.—Our little farm dog "Trip" is of mongrel descent, yet he has more than an ordinary amount of "gray matter" in his brains. He is very sagacious and knowing, and only seems to lack the power of speech to show that sensible ideas run through his head. He likes to leap from a stump into my arms as I am on horseback, and go off with me at a full gallop. One day a lot of pigs got out of their enclosure through a little hole at the apex of an acute angle, or corner, of the fence. This angle widened into the garden where the pigs were not tolerated. As soon as "Trip" saw them he went after them to get them out. They fled before him into this angle and began, slowly, of course, to make their way through. As soon as he saw them all within the angle, he stopped before its widest opening—the base—and intently watching, waited until the last one had crawled back into its proper enclosure. He seemed to understand that if he made a dash at them they would turn around and rush back into